

REMARKS

The foregoing amendments and these remarks are in response to the Office Action dated October 28, 2010. A Request for Continued Examination accompanies this Response. Applicant respectfully requests a three month extension of time and authorization is given to charge the appropriate fees to Deposit Account No. 50-0951.

At the time of the Office Action, claims 1, 2 and 4-6 were pending. Claims 7-14 were withdrawn in a previously issued Restriction Requirement. In the Office Action, claims 1, 2 and 4-6 were rejected under 35 U.S.C. §112, first paragraph. Claims 1, 2 and 4-6 were rejected under 35 U.S.C. §103(a). The rejections are discussed in more detail below.

I. Rejections under 35 U.S.C. §112

Claim 1, 2 and 4-6 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Claim 1 presently recites "said gas flows being fed into said reactor in a predetermined feed direction substantially coaxial to a longitudinal axis of said reactor." The Office Action asserts that Figure 1 and page 6, lines 20-24 of the application disclose that the hydrocarbon gas feed is generally perpendicular to the longitudinal axis of the reactor. Applicant notes that Figure 1 shows an initial feed portion 19 which is coaxial with the longitudinal axis of the reactor, and in which the swirling device 12 is located. This finds support at least at page 5, line 24 through page 6, line 2. Additionally it is noted that page 6, lines 20-24 referenced in the Office Action refers to the initial duct C that carries the first gas flow to the reactor prior to its introduction into reactor in the interspace 9 in the first duct 8. The first duct 8 is coaxial with the second duct 7 (see page 6, lines 3-10), and the first gas flow is made to pass through distributor device 10 in order to obtain a uniform speed distribution within the interspace 9. Thus, after the first gas flow has been introduced into the feed portion 19, it flows coaxial to the longitudinal axis of the reactor within the duct 8 in the feed portion 19, and then is mixed with the second gas flow when the second gas flow reaches the open end 18 of the duct 7 (see page 7, 10-18). Accordingly, withdrawal of this rejection is respectfully requested.

II. Rejections based upon art

Claims 1, 2, and 4 were rejected under 35 U.S.C. §103(a) as being unpatentable over PCT Publication No. WO 2000/047517 to *Bedetti* (hereinafter "*Bedetti*") in view of U.S. Patent Publication No. 2003/0188486 to *Tanaka* (hereinafter "*Tanaka*"). Claims 5 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Bedetti* and *Tanaka* as applied to claims 2 and 1, respectively, and further in view of U.S. Patent Publication No. 2004/0047777 to Pettit (hereafter "*Pettit*").

As indicated in the Office Action, the process of claim 1 differs from the process disclosed in *Bedetti* at least for the features recited in the last wherein clause. However, contrary to that stated in the Office Action, these features are neither disclosed nor suggested by the other cited document *Tanaka*. Nevertheless, purely in the interests of expeditious prosecution, applicant has amended claim 1 to clarify that the hydrocarbons of the first gas flow are substantially simultaneously oxidized by the oxygen of the second gas flow during the mixing of the flows.

Applicant notes that *Tanaka* is concerned with a totally different technical field, namely, fuel reformers for fuel cell plants for vehicles (see *Tanaka*, page 1, paragraph (0018)), which has nothing to do with catalytic secondary reforming processes. Catalytic secondary reforming processes (also called autothermal reforming processes) are used for the industrial production of huge quantities of synthesis gas necessary for industrial scale production of chemical compounds such as ammonia or methanol. These processes are very well known in the art, and identify to one skilled in the art a clear and specific technology, which cannot be confused or compared with the technical field of *Tanaka*.

Additionally, *Tanaka* teaches that the liquid fuel is mixed with a gas flow comprising oxygen (see, *Tanaka*, page 1, paragraph [00201] instead of a gas flow comprising hydrocarbons as in the present claims.

Another essential difference between the fuel reformer of *Tanaka* and the process according to claim 1 is that no reaction (oxidation) takes place simultaneously with the mixing of

the hydrocarbons with the oxygen in *Tanaka*. In fact, in *Tanaka* chamber 12 is merely a pre-mixing chamber and not a combustion chamber as well. According to *Tanaka* no oxidation should take place when fuel and oxygen are mixed. Throughout *Tanaka* it is clearly stated that in the pre-mixing chamber 12, a fuel-air mixture is obtained which is further mixed in the homogenizing filter 17 and made to react within the reforming catalyst 11 (see *Tanaka*, page 2, paragraph (0024), page 2, paragraphs (0031), [0033]).

In *Tanaka*, the fuel does not simultaneously oxidize when mixed with the air. *Tanaka* teaches a completely different process with respect to the catalytic secondary reforming process of the present claims and thus it cannot be considered as a relevant document for the assessment of inventive step of the subject-matter of claim 1. One who is skilled in the art aiming to solve the technical problem set forth at page 3, lines 4-11 of the present application, would never have arrived at the claimed solution of the problem in view of *Bedetti* and *Tanaka* without the exercise of an inventive skill.

In this respect, it is further noted that the specific process and burner disclosed in *Bedetti* comprise features (see the characterizing portion of claims 1 and 5) which make them totally unsuitable for being modified with the mixing step as claimed in claim 1 of the present application. The rotating swirling motion recited in claim 1 of the present application is in total contrast and has nothing to do with the plurality of jets of *Bedetti*. These are fully opposite technology which cannot be combined together. A person skilled in the art would have thus never conceived the claimed process starting from *Bedetti* as the closest prior art.

Claim 1 is thus believed to be patentable over the cited prior art for at least the foregoing reasons. The dependent claims are also believed allowable because of their dependence upon an allowable base claim, and because of the further features recited.


III. Conclusion

Applicant has made every effort to present claims which distinguish over the prior art, and it is thus believed that all claims are in condition for allowance. Nevertheless, Applicant invites

the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicant respectfully requests reconsideration and prompt allowance of the pending claims.

Respectfully submitted,

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